AMENDMENTS TO THE CLAIMS

1. (Currently amended) A microfluidic system, comprising:

a first substantially enclosed fluid path;

a second substantially enclosed fluid path;

a first contact region comprising an intersection between the first and second fluid paths; and

a first convection controller segregating the first and second fluid paths and positioned at the first contact region, the first convective controller having a cross-sectional dimension perpendicular to ~~the~~ a direction of diffusion across the first convective controller of less than about 1 mm,

wherein at least one of the first fluid path and the second fluid path has a cross-sectional dimension of less than about 1mm.

2. (Original) The microfluidic system of claim 1, wherein the first fluid path and the second fluid path are substantially tangentially intersecting at the first contact region.

3. (Original) The microfluidic system of claim 1, wherein at least one of the first fluid path and the second fluid path is substantially rectangular in cross-section at the first contact region.

4. (Original) The microfluidic system of claim 1, wherein the first fluid path and the second fluid path have a crossing angle between about 45 and 135 degrees.

5. (Original) The microfluidic system of claim 4, wherein the first fluid path and the second fluid path have a crossing angle of about 90 degrees.

6. (Cancelled)

7. (Previously presented) The microfluidic system of claim 1, wherein the convection controller has an affinity for at least one material to be used within the microfluidic system and

repulses at least one material to be used within the microfluidic system.

8. (Previously presented) The microfluidic system of claim 1, wherein the convection controller carries an electrical charge.

9. (Previously presented) The microfluidic system of claim 1, wherein the convection controller comprises pores about 0.05 to 0.2 micrometers in average diameter.

10. (Previously presented) The microfluidic system of claim 1, wherein the convection controller comprises pores about 0.1 micrometers in diameter.

11. (Previously presented) The microfluidic system of claim 1, wherein the convection controller comprises a portion about 5 to 50 microns thick.

12. (Original) The microfluidic system of claim 11, wherein the convection controller comprises a portion about 10 microns thick.

13. (Previously presented) The microfluidic system of claim 1, wherein the convection controller comprises a membrane.

14. (Original) The microfluidic system of claim 13, wherein the membrane comprises polycarbonate.

15. (Original) The microfluidic system of claim 1, further comprising an interaction material positioned within one of the first fluid path and the second fluid path.

16. (Original) The microfluidic system of claim 15, wherein the interaction material is one of a test fluid and an indicator.

17. (Original) The microfluidic system of claim 15, wherein the interaction material is immobilized within the one of the first fluid path and the second fluid path.

18. (Original) The microfluidic system of claim 1, wherein the convection controller comprises:

a first membrane; and

a second membrane in spaced relation to the first membrane.

19. (Original) The microfluidic system of claim 18, wherein the first membrane and the second membrane are no more than 500 micrometers apart.

20. (Original) The microfluidic system of claim 19, wherein the first membrane and the second membrane are no more than 250 micrometers apart.

21. (Original) The microfluidic system of claim 20, wherein the first membrane and the second membrane are no more than 100 micrometers apart.

22. (Original) The microfluidic system of claim 1, further comprising:

a third fluid path segregated from the second fluid path by a second convection controller at a second contact region; and

a fourth fluid path segregated from the first fluid path by a third convection controller at a third contact region and segregated from the third fluid path by a fourth convection controller at a fourth contact region.

23. (Original) The microfluidic system of claim 22, wherein the first convection controller, the second convection controller, the third convection controller and the fourth convection controller comprise a single convection controller.

24. (Original) The microfluidic system of claim 22, wherein at least one of the first fluid path and the second fluid path comprises a cross-sectional dimension of less than about 300m.

25. (Original) The microfluidic system of claim 24, wherein at least one of the first fluid path and the second fluid path comprises a cross-sectional dimension of less than about 100m.

26. (Original) The microfluidic system of claim 25, wherein at least one of the first fluid path and the second fluid path comprises a cross-sectional dimension of less than about 50m.

27. (Original) The microfluidic system of claim 1, wherein both the first fluid path and the second fluid path have a cross-sectional dimension of less than about 500m.

28. (Previously presented) A fluidic system, comprising:

a first substantially enclosed fluid path;

a second substantially enclosed fluid path;

a third substantially enclosed fluid path segregated from the first fluid path by a convection controller positioned at a first contact region comprising an intersection between the first and third fluid paths, the third fluid path also being segregated from the second fluid path by a convection controller positioned at a second contact region comprising an intersection between the second and third fluid paths; and

a fourth substantially enclosed fluid path segregated from the first fluid path by a convection controller positioned at a third contact region comprising an intersection between the first and fourth fluid paths, the fourth fluid path also being segregated from the second fluid flow path by a fourth convection controller positioned at a fourth contact region comprising an intersection between the second and fourth third fluid paths.

29. (Previously presented) A fluidic array, comprising:

a first set of substantially enclosed fluid paths arranged generally parallel to one another;

a second set of substantially enclosed fluid paths arranged generally parallel to one another

and crossing the first set of fluid paths such that a plurality of contact regions are formed at intersections between at least some of the fluid paths in the first set of fluid paths and at least some of the fluid paths in the second set of fluid paths; and

a convection controller segregating one of the first set of fluid paths from one of the second set of fluid paths, the convection controller positioned at one of the contact regions.

30. (Previously presented) A method of promoting interaction, comprising:

introducing a first fluid including a first material into a first fluid path having a cross-sectional dimension of less than 1 millimeter;

introducing a second fluid including a second material into a second fluid path segregated from the first fluid path by a convection controller positioned at a contact region, the contact region comprising an intersection between the first and second fluid paths;

allowing the first and second materials to interact at the contact region;

forming a product from the interaction of the first and second materials; and

immobilizing the product at the contact region.

31. (Original) The method of promoting interaction of claim 30, further comprising maintaining a pressure within the first fluid path at the contact region substantially equal to a pressure within the second fluid path at the contact region.

32. (Original) The method of promoting interaction of claim 30, further comprising diffusing at least one of the first material and the second material into the convection controller.

33. (Cancelled)

34. (Original) The method of promoting interaction of claim 30, further comprising immobilizing at least one of the first fluid in the first fluid path and the second fluid in the second fluid path.

35. (Original) The method of promoting interaction of claim 30, wherein the first fluid is the first material.

36. (Original) The method of promoting interaction of claim 30, wherein the second fluid is the second material.

37-61. (Cancelled)

62. (Previously presented) A method of promoting interaction, comprising:

providing a fluidic system comprising first, second and third fluid paths, wherein at least one fluid path of the fluidic system comprises a cross-sectional dimension of less than one millimeter and a first interaction material patterned therein;

flowing at least a portion of a first fluid from a first fluid source into the first fluid path;

partitioning portions of a second fluid from a second fluid source into each of the second and third fluid paths;

mixing at least a portion of the first fluid with the portion of second fluid in the second fluid path to form a third fluid;

mixing at least a portion of the third fluid with the portion of second fluid in the third fluid path to form a fourth fluid,

wherein at least one of the first, second, third or fourth fluids comprises a second interaction material; and

allowing interaction between the first and second interaction materials.

63. (Original) The method of claim 62, further comprising:

observing the interaction of the first and second interaction materials.

64. (Previously presented) The method of claim 62, wherein providing further comprises providing a fluidic system comprising a plurality of fluid paths and a first plurality of interaction

materials patterned within them and wherein flowing further comprises flowing a plurality of fluids comprising a second plurality of interaction materials into the plurality of fluid paths.

65-76. (Cancelled)

77. (Previously presented) A method as in claim 62, comprising:
flowing the third fluid past a first sensor; and
flowing the fourth fluid past a second sensor.

78-82. (Cancelled)

83. (Previously presented) An apparatus, comprising:

at least first, second, and third fluid paths each having an inlet end and a region downstream from the inlet end;

the inlet of the first fluid path being fluidly connectable to a first source of fluid;

the inlets of the second and third fluid paths being fluidly connectable to a second source of fluid;

a first connecting path fluidly connecting the first fluid path and the second fluid path downstream of the inlet end of each; and

a second connecting path fluidly connecting the second fluid path and the third fluid path downstream of the inlet end of each, and downstream of the connection of the second fluid path to the first connecting path,

wherein at least one of the first or second fluid connecting paths comprises a mixer.

84. (Original) The apparatus of claim 83, wherein the third fluid path is not connected to any other fluid path between its inlet and its connection to the second connecting fluid path.

85. (Previously presented) A method as in claim 62 comprising:

flowing a first fluid in a first channel and a second fluid in a second channel and in a third channel;

mixing at least a portion of the first fluid with the second fluid in the second channel to produce a third fluid; and

mixing at least a portion of the third fluid with the second fluid in the third channel to produce a fourth fluid,

wherein the fluid comprising the second interaction material is the first, second, third or fourth fluid.

86-89. (Cancelled)

90. (Previously presented) A microfluidic system as in claim 18, wherein the first and second membranes define first and second surfaces of a reservoir.

91. (Previously presented) A microfluidic system as in claim 1, comprising a polymeric article comprising the first and second fluid paths.

92. (Previously presented) A microfluidic system as in claim 1, wherein the first and second fluid paths are formed in different layers of material, and the first convective controller is positioned between the layers.

93. (Previously presented) A microfluidic system as in claim 1, wherein each of the cross-sectional dimensions of the first convective controller is less than 1 mm.

94. (Previously presented) A microfluidic system as in claim 1, wherein the width of the first and/or second fluid paths is less than 1 mm.

95. (Previously presented) A microfluidic system as in claim 1, wherein the convection controller comprises a gel.

96. (Previously presented) A microfluidic system as in claim 1, comprising an interaction material associated with the first convection controller.

97. (Previously presented) A microfluidic system as in claim 96, wherein the interaction material is a protein.

98. (Previously presented) A microfluidic system as in claim 96, wherein the interaction material is immobilized within the first convection controller .

99. (Previously presented) A microfluidic system as in claim 96, wherein the interaction material is immobilized on a surface of the first convection controller.

100. (Previously presented) A method of promoting interaction as in claim 30, wherein the interaction involves binding of a protein.

101. (Previously presented) A method of promoting interaction as in claim 30, wherein at least one of the first and second materials is associated with a bead.

102. (Previously presented) A microfluidic system as in claim 18, wherein the first membrane comprises pores of a first size and the second membrane comprises pores of a second size different from the first size.

103. (Previously presented) A microfluidic system as in claim 83, wherein the mixer is a static mixer.

104. (Previously presented) A microfluidic system as in claim 103, wherein the static mixer comprises a chaotic advective mixer.

105. (Previously presented) A microfluidic system as in claim 83, further comprising a membrane associated with at least one of the fluid paths.

106. (Previously presented) A microfluidic system as in claim 83, further comprising a substrate with a material patterned thereon.

107. (Previously presented) A microfluidic system as in claim 106, wherein the material is patterned onto the substrate in at least one strip.

108. (Previously presented) A microfluidic system as in claim 106, wherein the material is patterned onto the substrate in a plurality of strips.

109. (Previously presented) A microfluidic system as in claim 105, wherein an interaction material is patterned onto the membrane.